



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/636,105	08/07/2003	Wushing Yin	INDUM-110XX	9143
207	7590	03/29/2006	EXAMINER	
WEINGARTEN, SCHURGIN, GAGNEBIN & LEOVICI LLP			NGUYEN, DONGHAI D	
TEN POST OFFICE SQUARE				
BOSTON, MA 02109			ART UNIT	PAPER NUMBER
			3729	

DATE MAILED: 03/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/636,105	Applicant(s) YIN ET AL.	
	Examiner Donghai D. Nguyen	Art Unit 3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-14,17,19-27 and 31-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-14,17,19-27 and 31-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/9/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendment filed on 08 February 2006 has been considered and made of record.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 3, 4, 14, 17, 19, 20, 23, 32 and 34-35 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 6,121,689 to Capote et al.

Regarding claims 1, 19, 34 and 35, Capote et al disclose a method for mating an integrated circuit device (10) having a plurality of conductive contacts (14) with contact tips arranged in a predetermined pattern and extending from one surface of said device to a substrate (20) having a plurality of conductive pads (12) arranged on one surface of said substrate in said predetermined pattern, said method comprising the steps of: applying a passivation layer (not shown, See Col. 10, lines 40-43) to said surface of said device having said contacts extending therefrom; applying over said passivation layer a layer of a first filled underfill (silica 37, see Fig. 10) to said surface of said device having said contacts extending therefrom; partially curing said first filled underfill (See Col. 5, lines 52-54); applying a layer of a second low-viscosity, lightly-filled underfill (39) to at least said conductive pads (12) of said substrate surface (20), wherein the second low-viscosity lightly-filled underfill is filled between 0-30% by weight

Art Unit: 3729

(metal filler particle see Col. 18, lines 17-20) and comprises a curing agent wherein the curing agent is at least one of anhydride, phenolic resin, amine, or a mixture thereof (See Col. 8, line 15); aligning said device with said substrate such that said contacts are adjacent corresponding pads (see Figs. 10, 13, 14); and subjecting said device and said substrate to a reflow process to conductively couple said conductive contacts to said conductive pads (see Fig. 11 and Col. 9, lines 55-63).

The limitation of claims 19, 34 and 35 are also satisfied as the above discussion.

Regarding limitations of claims 3 and 4, see Fig. 12 and Col. 10, lines 2-5.

Regarding claims 14 and 17, Capote et al disclose the step of coating at least said pads (12) with a fluxing/curing agent or a polymer flux (34 see Col. 12, lines 3-20).

Regarding claim 20, Wang et al disclose the step of curing said first underfill and said second underfill (See Col. 5, lines 52-54).

Regarding claim 23, Capote et al disclose the conductive contacts being reflowing by infra red oven (see Col. 9, line 58).

Regarding claims 32, see Col. 16, line 49.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 13, 21, 22, 24-27, 31 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Capote et al.

Regarding claims 13, 21, 22, and 24-27, Capote et al disclose the conductive contacts being reflowing by infra red oven or by any known technique in the art (see Col. 9, lines 55-61), but do not disclose the contact being reflowed by applying hot gas or blowing air, etc. as recited in the above claims. However, these processes are conventional and well known in the art. Therefore, it would have been an obvious to one having ordinary skill in the art at the time the invention was made to utilize the process of applying forced hot gas, forced hot air to said device and said substrate to reflow said conductive contacts within an infra red oven, in a hot bar reflow process, in a hot plate reflow process, in a vapor phase reflow process or in a fume gas reflow process, etc. as so to form a solder joint by using the available techniques.

Regarding claims 31 and 33, Capote et al disclose the curing agent is anhydride and amine but do not disclose the specific type of anhydride and amine. It would have been an obvious matter of design choice to one having ordinary skill in the art at the time the invention was made to choose any desired anhydride and amine material as recited in claims 31 and 33, since Applicants have not disclosed that the claimed specifics anhydride and amine material, would solve any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the anhydride and amine material disclosed by Capote et al.

6. Claims 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Capote et al in view of US Patent 6,168,972 to Wang et al.

Regarding claims 5-12, Capote et al do not disclose the steps of: applying the first underfill and removing said the first underfill from the tips of said conductive contacts by variety of methods. Wang et al teach the steps of: applying the first underfill by spinning, brushing, dispensing or screen printing (See Col. 5, lines 65-66) and removing said first underfill from said tips of said conductive contacts (205 Figs. 5B-C show the) by variety techniques such as: chemically mechanically polishing, reactively ion etching laser milling or ablating said layer of first underfill for exposing said tips of said contacts (Col. 6, lines 61-63, Col. 7, lines 21-23, lines 59-61 and Col. 8, lines 4-6, etc.) thereby planarizing the contacts to ensure uniformly transmit stress from the contacts across the chip (Col. 7, lines 62-67). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Capote et al by utilize the teaching of applying and removing said first underfill from said tips of said conductive contacts as taught by Wang et for exposing said tips of said contacts in order to planarize the contacts to ensure uniformly transmit stress from the contacts across the chip.

Response to Arguments

7. Applicant's arguments with respect to claims 1, 3-14, 17, 18-27 and 31-35 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghai D. Nguyen whose telephone number is (571)-272-4566. The examiner can normally be reached on Monday-Friday (9:00-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter D. Vo can be reached on (571)-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DN
March 23, 2006


MINH TRINH
PRIMARY EXAMINER